

ADS-B Industry Day

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AGENDA

- **ATM Environment Expectations**
- **Honeywell ATM Mission**
- **Honeywell Innovations & Experience**
- **Role of ADS-B in ATM Modernization**
- **Surveillance Technology Plan**
- **Current ADS-B Supporting Products**

Global ATM Environment

- **Traffic densities will continue to grow... perhaps faster than before**
 - **Passenger Traffic Growth driven by:**
 - **Business more global**
 - **Ticket prices declining... high elasticity of demand**
 - **Cargo Traffic Growth driven by:**
 - **Business more global**
 - **Supply chains are shortening**
 - **Road & rail infrastructure limitations**
 - **Business Aviation Growth driven by:**
 - **Business more global... have to be there**
 - **More direct control of safety and security**
 - **Microjets being introduced**
 - **General Aviation Growth driven by:**
 - **Introduction of new, high performance, lower cost, composite airplanes**
 - **New generation of high performance avionics and integrated cockpits**



Global ATM Environment

- **Technology existing today can significantly improve ATC performance**
 - *Make planes, ground stations, and satellites “smarter”*
 - *Information-centric system employing advanced networking concepts*
- **Broad benefits from new system**
 - *Fewer delays & cancellations driving productivity and economic growth*
 - *Reduced fuel burn and emissions by 5-10%*
 - *More capacity out of existing airports – 10-20% less build*

Clear Need to Modernize Air Traffic Management

Helping Drive ATM Modernization Through:



- **Breadth of Experience** – Honeywell has extensive experience in all aviation segments from Air Transport through light piston General Aviation.
- **Systems Approach** – Honeywell's expertise on both airborne and ground-based applications gives us a comprehensive airspace systems perspective.
- **Industry Engagement** – Honeywell actively participates in global ATM modernization forums.
- **Technology and Products**



Modernizing Surveillance with ADS-B Honeywell

- **Significantly reduces the cost to perform ground-based surveillance.**
- **Enables better overall surveillance coverage vs existing ground stations.**
- **Enables advanced airborne applications such as merging and spacing, dual-stream arrivals in reduced visibility. This will create opportunities to:**
 - **Increase airspace capacity and efficiency**
 - **Drive further cost reductions**
- **Light aircraft operators benefit from improved Situational Awareness, more efficient routing through congested airspace.**
- **Cornerstone for the future network-enabled ATM system.**

ADS-B is the enabler for many ATM operational improvements

Honeywell's Surveillance Experience

Honeywell

- **Airborne Traffic Solutions**
 - TAS, TCAS I, TCAS II, and Transponder equipment
 - ADS-B-based position information transmission
 - Traffic Computer Development

- **Ground Based Solutions**
 - Flight Information Services Network (FISDL)
 - Nationwide VHF radio transmitters for Weather Uplink
 - Ground Based GPS Augmentation System (LAAS)
 - Improves airport surface area surveillance capabilities

Honeywell Innovations in Surveillance

Honeywell

- First to use TCAS to perform rendezvous and refueling mission with ETCAS and Aircraft Identification via Mode A code tracking
- The Formation Flight System (FFS) for C17 is the most precise and advanced ADS-B traffic surveillance application. ADS-B data allows autopilot-coupled station keeping with 4000 ft in-track and 500 ft cross-track spacing.
- Certified the first transponder to broadcast ADS-B.
- Our A380 AESS is the first Air Transport transponder certified to DO260A
- Our new TCAS has demonstrated ADS-B in flight range performance of 120-140 nmi.
- Demonstrated for Airbus the TCAS-based implementation of their "Traffic Computer" ATSAW / ITP ADS-B application.
- Honeywell's KT73 was the ADS-B transponder used in the Air Services Australia's ADS-B trials.

Honeywell product innovations scale between Air Transport through General Aviation

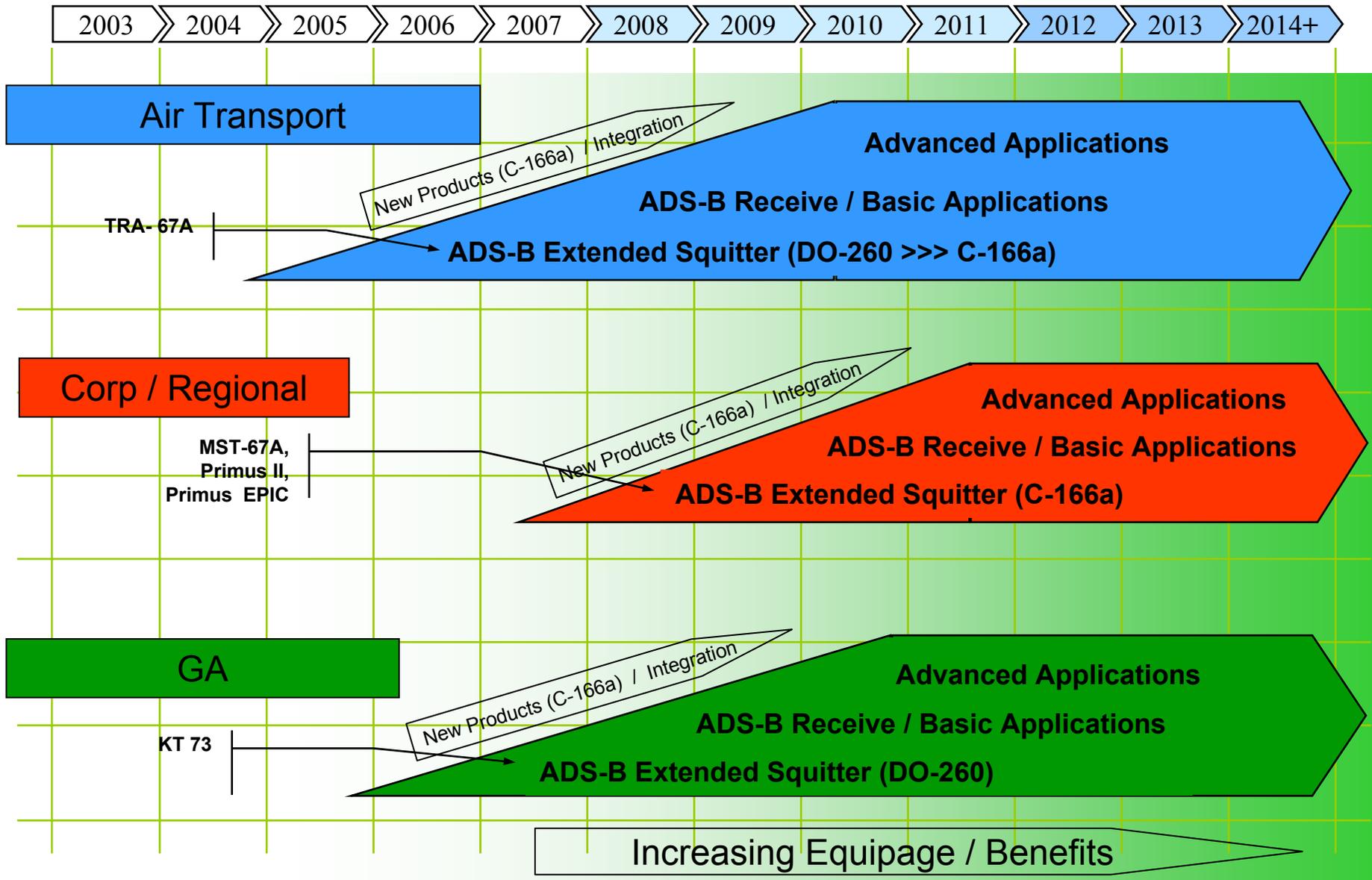
Honeywell's Surveillance Product Plan

Honeywell

- **Support Air Transport, Regional, Corporate and General Aviation marketplace with best-in-class surveillance products.**
- **Support mandates for Elementary and Enhanced Surveillance.**
- **Engage in efforts to promote ADS-B surveillance products to further the transition towards advanced operational capability.**
- **Develop additional ADS-B receive-capable products**

ADS-B Road-Map (Going Forward)

Honeywell



TPA-100A TCAS Processor

Honeywell

- Certified to TSO C119b, DO 185A
- ACAS II (TCAS II Change 7) Compliant
- Hardware ready for Traffic Computer solution
- 4 MCU & 6 MCU models
- Increased reliability, reduced power consumption, reduced weight
- Range extended to 120+ miles



ADS-B IN – Available Now!

MST 67A Transponder

Honeywell

- Certified to TSO C112, DO 181C, ETSO 2C112A
- ACAS II (TCAS II Change 7) Compliant
- Elementary and Enhanced Surveillance
- PS-550/578 Flight ID Control Panel
- Level 3 Datalink



ADS-B Out Upgrade Planned

Primus II Integrated COM

Honeywell

- Certified to TSO C-112, DO 181, ETSO 2C112A
- ACAS II (TCAS II Change 7) Compliant
- Elementary Surveillance and Enhanced Surveillance
- RM 850 / 855 Flight ID capable
- Level 3 datalink

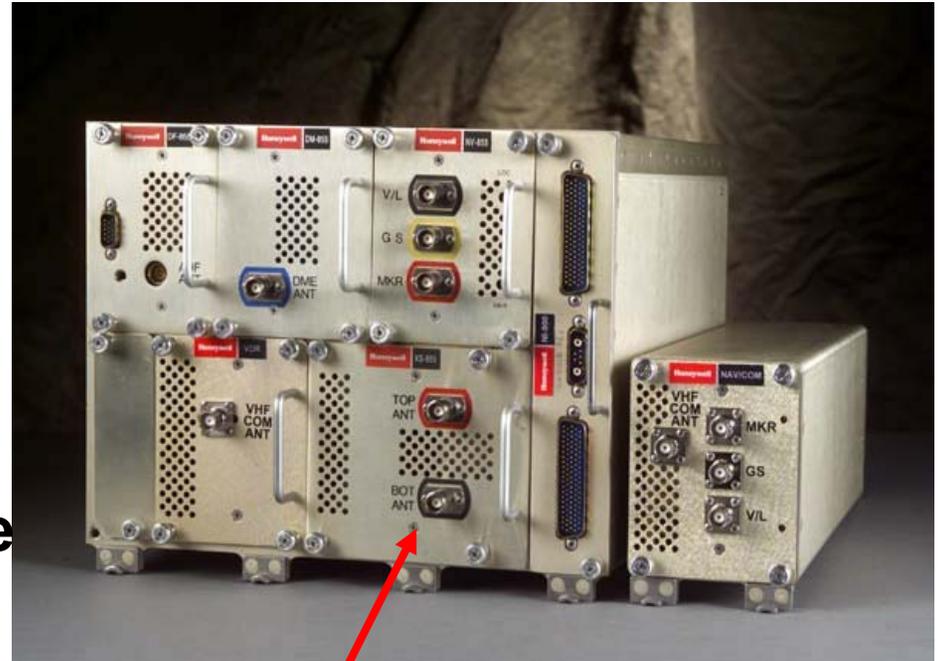


ADS-B Out Upgrade Planned

Primus Epic Transponder

Honeywell

- Certified to TSO C-112, DO 181, ETSO 2C112A
- ACAS II (TCAS II Change 7) Compliant
- Elementary Surveillance and Enhanced Surveillance
- EPIC MCDU Flight ID capable
- Level 3 datalink



Transponder

ADS-B Out Upgrade Planned

KT 73 Transponder

Honeywell

- Certified to TSO C112, DO 181C, JTSO 2C112A
- Traffic Information Service (TIS)
- Elementary Surveillance
- DO-260 1090 Extended Squitter Compliance
- Level 2 Datalink



ADS-B Out Available Now!

ADS-B Discussion Issues

- **Will there be motivation (i.e. operational advantages, mandate, etc.) for our customers to buy equipment upgrades?**
- **Have we thoroughly examined the operational requirements to ensure they are consistent with product capabilities over the long term and both support the long term vision?**
- **Will appropriate funding be available to put the infrastructure in place in a timely manner relative to aircraft equipage?**
- **Have we examined the security issues carefully to ensure we can mitigate risks to the system**